Appendix C
TIMET Health and Safety Plan

HEALTH AND SAFETY PLAN
TITANIUM METALS CORPORATION FACILITY
HENDERSON, NEVADA

Prepared for:
Titanium Metals Corporation
181 Water Street
Black Mountain Industrial Center
Henderson, Nevada 89015

Date Prepared :	February 2010
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EMERGENCY INFORMATION
POST ON SITE
EMERGENCY CONTACTS AND ROUTE TO HOSPITAL

TITANIUM METALS CORPORATION FACILITY
HENDERSON, NEVADA

Emergency Contact	Telephone No.
U.S. Coast Guard National Response Center	(800) 424-8802
InfoTrac Chemical Monitoring System	(800) 535-5053
WorkCare	(800) 455-6155
Fire Department	911
Police Department	911
On-Site Health and Safety Officer	
Titanium Metals Corporation:	
Craig Wilkinson, Manager	(702) 465-2544
Medical Emergency:	
Hospital Name: St. Rose Dominican Hospital Rosa de Lima Campus	
Hospital Address: 102 East Lake Mead Drive Henderson, Nevada	
Hospital Telephone No.:	Emergency - 911
	General – (702) 564-2622
Ambulance Telephone No.:	911
Route to Hospital: (see next page hospital route map)	
From plant entrance, proceed east/northeast on Lake Mead Drive about ½ mile until you reach the hospital.	

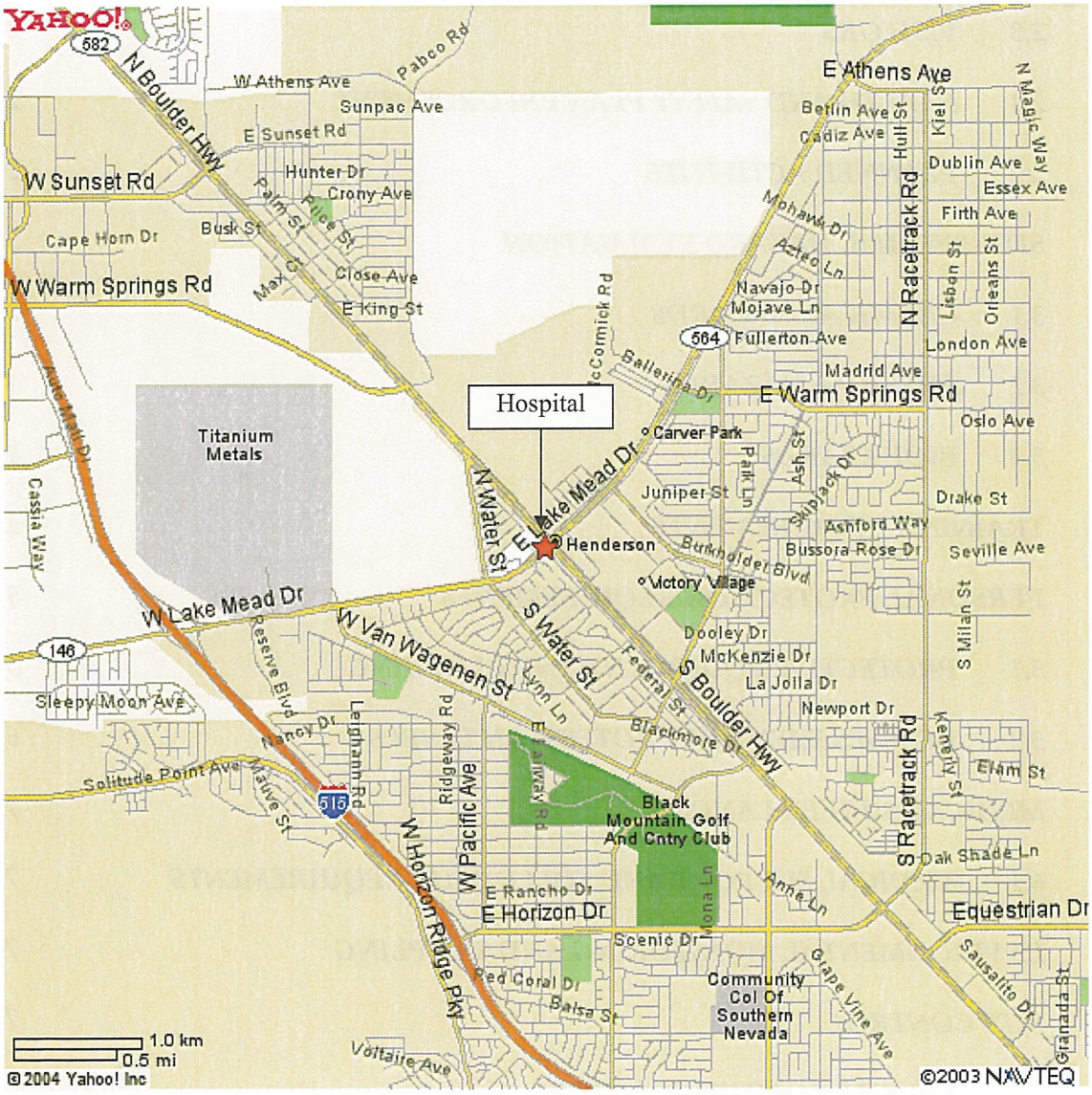
Notes:

This sheet must be posted on site.

On-Site Health and Safety Officer must be designated prior to start of work.

EMERGENCY INFORMATION
POST ON SITE
HOSPITAL ROUTE MAP

ST. ROSE DOMINICAN HOSPITAL ROSA DE LIMA CAMPUS
102 EAST LAKE MEAD DRIVE
HENDERSON, NEVADA



Note: This sheet must be posted on site.

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1.0 *INTRODUCTION*

The purpose of this health and safety plan (HASP) is to define requirements and designate protocols to be followed during the investigation and sampling activities at the Titanium Metals Corporation (TIMET) facility. This HASP summarizes potential hazards and defines protective measures to be followed during the sampling activities summarized in the associated detailed Work Plan provided with this HASP. This HASP has been modified from TIMET'S general *Health and Safety Plan* to meet the needs of the specific investigation sampling activities outlined in the associated Work Plan.

Protocols established in this HASP are based on site conditions and health and safety hazards known or anticipated to be present and on available site data. Specifications herein are subject to review and revision based on actual conditions encountered in the field during site activities.

2.0 *HEALTH AND SAFETY PERSONNEL AND PLAN ENFORCEMENT*

This section describes responsibilities of project personnel, summarizes requirements for subcontractors and visitors who wish to enter TIMET facility, and discusses HASP enforcement.

2.1 *PROJECT PERSONNEL*

The following personnel and organizations are associated with planned activities at the site.

Name/Title	*Responsibility*	*Telephone No.*
Client Emergency Contact:		
Craig Wilkinson TIMET	Environmental and Health and Safety Manager	(702) 465-2544
Sampling Personnel:		
To be determined	On-site Health and Safety Officer (OSHO)	
To be determined	Field Team Leader	To be determined

Prior to initiating the sampling activities an On-site Health and Safety Office (OHSO) and Field Team Leader will be designated.

2.2 *SUBCONTRACTORS*

Subcontractor personnel participating in environmental investigation activities will be required to read and comply with all sections of this plan. All subcontractor personnel entering the site must sign the Compliance Agreement form (see Appendix A). Subcontractor personnel must comply with all applicable 29 CFR 1910.120 training, fit testing, and medical surveillance requirements. Subcontractors are responsible for providing PPE required by this plan for their personnel and are directly responsible for the health and safety of their employees.

2.3 *VISITORS*

All site visitors will be required to read the HASP and sign the Compliance Agreement form (see Appendix A). Visitors will be expected to comply with relevant OSHA requirements. Visitors will also be expected to provide their own PPE required by the HASP. Visitors must be accompanied by a trained TIMET or contractor employee. Visitors who have not met OSHA training, medical surveillance, and PPE requirements are not permitted to enter areas where exposure to hazardous materials is possible.

2.4 *HEALTH AND SAFETY PLAN ENFORCEMENT*

This HASP applies to all environmental investigation and sampling activities and all personnel working on the investigation and sampling activities outlined in the associated Work Plan.

Personnel will be encouraged to report to the OSHO any conditions or practices that they consider to be detrimental to their health or safety or they believe are in violation of applicable health and safety standards. Such reports may be made orally or in writing. Personnel who believe that an imminent danger threatens human health or the environment will be encouraged to bring the matter to the immediate attention of the OSHO for resolution.

At least one copy of this HASP will be available to all site personnel at all times. Minor changes in HASP procedures will be discussed at the beginning of each workday by the OSHO at the daily tailgate safety meeting.

2.5 *PLANNED ACTIVITIES*

Field activities to be conducted are detailed in the associated Work Plan and include the collection of soil and/or sediment samples using manual sample collection techniques and methods.

3.0 *SITE-SPECIFIC HAZARD EVALUATION*

Field activities and physical features of the site may expose field personnel to a variety of hazards. This section provides information on potential hazards related to site activities and the nature of hazardous material impacts. Potential chemical and physical hazards, as well as biohazards, related to site activities are discussed below.

3.1 *CHEMICAL HAZARDS*

The potential chemicals of concern for the investigation and sampling activities covered under this plan include polychlorinated biphenyl's (PCBs) and/or certain metals (i.e., silver, arsenic, barium, chromium, cadmium, mercury, lead and selenium). These chemicals pose various physical, chemical, and toxicological hazards. Potential routes of exposure include dermal (skin) contact, inhalation, and/or ingestion. The chemicals may also contaminate equipment, vehicles, instruments, and personnel. The overall health threat from exposure to these chemicals is uncertain because (1) actual concentrations that personnel could be exposed to cannot be predicted, (2) the actual duration of exposure is unknown, and (3) the effects of low-level exposure to a mixture of chemicals cannot be predicted. However, the potential for high-level exposure is considered remote based on preliminary sample data.

Specific information on potential chemical hazards at the site is provided in Table 1 (attached), including exposure limits, anticipated exposure routes, and toxic characteristics. Table 2 (attached) provides a general task hazard analysis for chemical and physical hazards at the site. Table 1 and Table 2 have been modified from information provided in TIMET's general *Heath and Safety Plan.*

The Material Safety Data Sheets (MSDS) included in the attachment to this HASP summarize health and safety information for hazardous materials that will be brought to the site, such as laboratory reagents, decontamination solutions, and sample preservatives. These materials may include, but are not limited to the following:

- Liquinox (decontamination detergent)
- Nitric acid (decontamination agent)
- Isopropanol (decontamination agent)
- Hexane (decontamination agent)

3.2 *PHYSICAL HAZARDS*

Physical hazards associated with site activities present a potential threat to on-site personnel. Potential physical hazards that have been identified for the investigation and sampling activities associated with this project include:

- Driving
- High noise levels
- Heat or cold stress
- Accidents caused by slipping, tripping, or falling
- Use of improper lifting techniques
- Improper use of equipment
- Drowning
- Subsurface utilities
- Improperly maintained equipment

Injuries resulting from physical hazards can be avoided by using safe work practices (SWP) and employing caution when working with machinery. Specific SWPs applicable to the investigation and sampling activities outlined in the associated Work Plan are listed in Section 8.4 of this HASP.

3.3 *BIOHAZARDS*

Biohazards may be encountered during site activities and present a potential threat to on-site personnel. Biohazards may include (1) contact with poisonous plants; (2) bites or stings from poisonous insects, such as the brown recluse spider, black widow spider, or scorpion; (3) bites from poisonous reptiles, such as the rattlesnake; and (4) bites or scratches from animals or contact with animal droppings. Site personnel should follow guidelines outlined in SWP 6-17, Biohazards (see Section 8.4), and the OSHO should discuss site-related biohazards and precautions during the daily tailgate meetings.

4.0 *TRAINING REQUIREMENTS*

All on-site personnel who may be exposed to hazardous conditions, including project team members and site visitors who will participate in on-site activities, will be required to meet training requirements outlined in 29 CFR 1910.120,

"Hazardous Waste Operations and Emergency Response." All personnel and visitors entering the site will be required to review this HASP and sign the Compliance Agreement form in Appendix A(HSP-4), and site workers will be required to attend a daily tailgate health and safety meeting and sign the Daily Tailgate Safety Meeting form (HST-2) (see Appendix A).

Before on-site activities begin, the OSHO will present a briefing for all personnel who will participate in on-site activities.

Issues that arise during implementation of on-site activities will be addressed immediately. Changes to health and safety procedures will be discussed during subsequent tailgate safety meetings to be held daily before the workday or shift begins and will be documented in the Daily Tailgate Safety Meeting form (Form HST-2 in Appendix A).

5.0 PERSONAL PROTECTION REQUIREMENTS

The levels of personal protection to be used for investigation and sampling tasks covered under this HASP have been selected based on known or anticipated physical hazards; types and concentrations of contaminants that may be encountered on site; and contaminant properties, toxicity, exposure routes, and matrixes. The following sections describe protective equipment and clothing; reassessment of protection levels; limitations of protective clothing; and respirator selection, use, and maintenance.

5.1 PROTECTIVE EQUIPMENT AND CLOTHING

Personnel will wear protective equipment when (1) site activities involve known or suspected contamination; (2) site activities may generate vapors, gases, or particulates; or (3) direct contact with hazardous materials may occur. The anticipated levels of protection selected for use by field personnel during site activities are listed in Table 2, Task Hazard Analysis. Based on the anticipated hazard level, personnel will initially perform field tasks in Level D protection. If site conditions or the results of air monitoring performed during on-site activities warrant a higher level of protection, all field personnel will withdraw from the site, immediately notify the OSHO, and wait for further instructions. Equipment and clothing requirements for Level D and Level C protection are provided below.

- Level D
    - Coveralls or work clothes

- Chemical-resistant clothing (such as Tyvek® or Saranex® coveralls)(as determined by the OSHO)
- Outer gloves (neoprene, nitrile, or other, as determined by the OSHO
- Disposable inner gloves (such as latex or vinyl) (as determined by the OSHO)
- Boots with steel-toe protection and steel shanks
- Disposable boot covers or chemical-resistant outer boots (as determined by the OSHO)
- Safety glasses or goggles
- Hard hat (face shield optional, as determined by the OSHO)
- Hearing protection (for areas with a noise level exceeding 85 decibels on the A-weighted scale)

• Level C

- Coveralls or work clothes
- Chemical-resistant clothing (such as Tyvek® or Saranex® coveralls)
- Outer gloves (neoprene, nitrile, or other, as determined by the OSHO)
- Disposable inner gloves (latex or vinyl)
- Boots with steel-toe protection and steel shanks
- Disposable boot covers or chemical-resistant outer boots
- Full- or half-face, air-purifying respirator with National Institute for Occupational Safety and Health (NIOSH)-approved cartridges to protect against organic vapors, dust, fumes, and mists
- Safety glasses or goggles (with a half-face respirator only)
- Hard hat (face shield optional, as determined by the OSHO)
- Hearing protection (for areas with a noise level exceeding 85 decibels on the A-weighted scale)

5.2 *REASSESSMENT OF PROTECTION LEVELS*

PPE levels shall be upgraded or downgraded based on a change in site conditions or investigation findings. When a significant change in site conditions occurs, hazards will be reassessed.

6.0 *MEDICAL SURVEILLANCE*

There are no project-specific medical monitoring requirements for the activities covered under this HASP.

6.1 *MEDICAL SUPPORT AND FOLLOW-UP REQUIREMENTS*

As a follow-up to an injury requiring care beyond basic first aid or to possible exposure above established exposure limits, all employees are entitled to and encouraged to seek medical attention and physical testing. Such injuries and exposures must be reported to the OSHO and TIMET emergency contact immediately. Depending on the type of injury or exposure, follow-up testing, if required, must be performed within 24 to 48 hours of the incident. It will be the responsibility of the employer's medical consultant to advise the type of test required to accurately monitor for exposure effects. Accident and Illness Investigation Reports, if needed are provided with TIMETs general *Health and Safety Plan.*

7.0 *ENVIRONMENTAL MONITORING AND SAMPLING*

During the investigation and sampling activities, environmental monitoring will be conducted for organic vapor, particulate matter and noise in accordance with the site-specific air monitoring requirements and action levels provided in Table 3 (attached) of TIMETs general *Health and Safety Plan.*

8.0 *SITE CONTROL*

The zone around the sampling area will be controlled by site personnel to prevent unauthorized and/or inadvertent entry to the work area.

8.1 *ON-SITE COMMUNICATIONS*

Successful communication between field teams and personnel in the support zone is essential. The following communication systems will be available during site activities:

- Cellular telephones
- Two-way radios

- Compressed air horn
- Megaphone
- Whistle

The hand signals listed below will be used by site personnel in emergency situations or when verbal communication is difficult.

Signal	Definition
Hands clutching throat	Out of air or cannot breathe
Hands on top of head	Need assistance
Thumbs up	Okay, I am all right, or I understand
Thumbs down	No or negative
Arms waving upright	Send backup support
Gripping partner's wrist	Exit area immediately

8.2 SITE CONTROL ZONES

To control the spread of contamination and employee exposures to chemical and physical hazards, on-site work areas may be divided into an exclusion zone, a decontamination zone, and a support zone. Access to the exclusion and decontamination zones will be restricted to authorized personnel. Any visitors to these areas must present proper identification and be authorized to be on site. The OSHO will identify work areas that visitors or personnel are authorized to enter and will enforce site control measures.

The following sections describe the exclusion zone, the decontamination zone, and the support zone as well as procedures to be followed in each.

8.2.1 Zone 1: Exclusion Zone

An exclusion zone includes areas where contamination is either known or likely to be present or, because of work activity, has the potential to cause harm to personnel. The perimeter of the exclusion zone and an appropriate radius around work task areas will be demarcated by a physical barrier, such as barricade tape or traffic cones, to restrict access.

8.2.2 Zone 2: Decontamination Zone

The decontamination zone will be established to decontaminate non-disposable sampling equipment, as necessary. Equipment decontamination procedures are described in the associated Work Plan.

8.2.3 *Zone 3: Support Zone*

A support zone may consist of any uncontaminated and nonhazardous part of the site. The support zone should be situated in an area generally upwind of any exclusion zone whenever possible. Site visitors not meeting training, medical surveillance, and PPE requirements must stay in the support zone.

8.3 *SITE ACCESS CONTROL*

Access to the TIMET site is controlled by fencing, security gates, sign-in points, and other control features as appropriate.

8.4 *SAFE WORK PRACTICES*

The following SWPs from TIMET's general *Health and Safety Plan* are applicable to the work covered under this HASP and will be adopted as part of this work. Copies of the SWP's referenced herein have not been included with this plan, but are available within TIMET's general *Health and Safety Plan.*

- SWP 6-1, General Safe Work Practices
- SWP 6-2, Control of Hazardous Energy Sources
- SWP 6-4, Excavation Practices
- SWP 6-5, Working Over or Near Water
- SWP 6-9, Fall Protection Practices
- SWP 6-10, Portable Ladder Safety
- SWP 6-11, Drum and Container Handling Practices for Drummed IDW
- SWP 6-12, Shipping Dangerous Goods
- SWP 6-14, Spill and Discharge Control Practices
- SWP 6-15, Heat Stress
- SWP 6-16, Cold Stress
- SWP 6-17, Biohazards
- SWP 6-26, Use of Heavy Equipment
- SWP 6-27, Respirator Cleaning Procedures
- SWP 6-28, Safe Work Practices for Use of Respirators

8.5 *EQUIPMENT DECONTAMINATION*

Decontamination of all non-disposable sampling equipment used during site activities will be required. Equipment decontamination procedures are described in the associated Work Plan.

9.0 *EMERGENCY RESPONSE PLANNING*

This section describes emergency response planning procedures to be implemented during the investigation and sampling activities covered under this HASP.

9.1 *PRE-EMERGENCY PLANNING*

During the pre-work briefing and daily tailgate safety meetings, all on-site employees will be trained in and reminded of the project and facility communication systems and site evacuation routes.

9.2 *PERSONNEL ROLES AND LINES OF AUTHORITY*

The OSHO has primary responsibility for responding to and correcting emergency situations and for taking appropriate measures to ensure the safety of site personnel and the public. Individual subcontractors, if utilized, are also required to cooperate with the OSHO, within the parameters of their scopes of work.

Personnel are required to report all injuries, illnesses, spills, fires, and property damage to the OSHO. The OSHO must be notified of any on-site emergencies and is responsible for ensuring that the appropriate emergency procedures described in this section are followed.

9.3 *EVACUATION ROUTES AND PROCEDURES*

In the event of an emergency that necessitates evacuation of a work task area or the site, the OSHO shall contact all nearby personnel using the on-site communications systems discussed in Section 8.1 to advise the personnel of the emergency. The personnel will proceed along site roads to a safe distance upwind from the hazard source. The personnel will remain in that area until the OSHO or an authorized individual provides further instructions.

9.4 *EMERGENCY CONTACTS AND NOTIFICATIONS*

The emergency information before Section 1.0 of this HASP provides names and telephone numbers of emergency contact personnel. THIS PAGE MUST BE POSTED ON SITE OR MUST BE READILY AVAILABLE AT ALL TIMES. In the event of a medical emergency, personnel will notify the appropriate emergency organization and will take direction from the OSHO.

9.5 *HOSPITAL ROUTE DIRECTIONS*

Before performing any site activities, the location and access routes to the nearest hospital will be reviewed with all project personnel. A map showing the hospital route is provided in the emergency information before Section 1.0 of this HASP.

9.6 *FIRE OR EXPLOSION*

In the event of a fire or explosion on site, the local fire department will be immediately summoned. The OSHO or a site representative will advise the fire department of the location and nature of any hazardous materials involved.

9.7 *WEATHER-RELATED EMERGENCIES*

Site work shall not be conducted during severe weather conditions, including high-speed winds or lightning. In the event of severe weather, field personnel will stop work, secure all equipment and leave the site.

Thermal stress caused by excessive heat or cold may occur as a result of extreme temperatures, workload, or the PPE used. Heat and cold stress treatment will be administered as described in SWPs 6-15 and 6-16 of TIMETs general *Health and Safety Plan*.

9.8 *SPILLS OR LEAKS*

In the event of a severe spill or a leak, site personnel will follow the procedures listed below.

- Evacuate the affected area and relocate personnel to an upwind location.
- Inform the OSHO, and TIMET emergency contact immediately.
- Locate the source of the spill or leak, and stop the flow if it is safe to do so.
- Begin containment and recovery of spilled or leaked materials.

- Notify appropriate local, state, and federal agencies.

Additional information on spill and leak control is presented in SWP 6-14 of TIMETs general *Health and Safety Plan.*

9.9 EMERGENCY EQUIPMENT AND FACILITIES

The following emergency equipment will be available on site:

- First aid kit
- Eye wash (portable)
- Fire extinguisher
- Two-way radio
- Site telephone
- Mobile telephone
- Sorbent material
- Drums
- Spill kits
- Berm material

9.10 REPORTING

All emergency situations require follow-up and reporting. The reporting requirements outlined in TIMETs general *Health and Safety Plan,* will be followed for any emergency situations that arise as part of the work covered under this HASP.

Tables

TABLE 3

SITE-SPECIFIC AIR MONITORING REQUIREMENTS AND ACTION LEVELS
TITANIUM METALS CORPORATION FACILITY, HENDERSON, NEVADA

Contaminant or Hazard	Task	Monitoring Device	Action Level	Monitoring Frequency	Action[a]
Organic vapors	Monitoring well installation, development, and sampling	FID and/or PID	BG to 5 ppm above BG	At the beginning of the task and every 30 to 60 minutes during the task	Use Level D PPE
	Stratigraphic boring installation		5 to 100 ppm above BG	Every 30 minutes	Use Level C PPE (unless specific chemicals are identified and evaluated using detector tube)
	Aquifer testing		> 100 ppm above BG	Not applicable	Stop work, evacuate area; notify OSHO and evaluate source
Combustible atmosphere	Soil boring or other invasive work at or near the landfill where landfill gases may pose exposition risk	CGI	<10% LEL	Continuous	Continue work
			10 to 25% LEL		Continue work with extreme caution
			>25% LEL		Stop work, evacuate area; notify OSHO and evaluate source
Oxygen-deficient or enriched atmosphere	None	Oxygen meter	19.5 to 23.5%	Continuous	Continue work
			<19.5% or >23.5%		Stop work, evacuate area; notify OSHO and evaluate source

TABLE 3 (Continued)

SITE-SPECIFIC AIR MONITORING REQUIREMENTS AND ACTION LEVELS
TITANIUM METALS CORPORATION FACILITY, HENDERSON, NEVADA

Contaminant or Hazard	Task	Monitoring Device	Action Level	Monitoring Frequency	Action[a]
External exposure to radiation	All environmental investigation activities	Radiation meter	Normal BG (Equipment must be calibrated in an area known to be free of radiation hazards)	Continuous or as needed	Continue work and monitoring when working in new areas
			Two to three times BG	Continuous	Notify SSC and proceed with caution
			Higher than three times BG	Not applicable	Stop work, evacuate area; notify OSHO and evaluate source
Particulates	All environmental investigation activities	Miniram PDM-3 particulate monitor	BG to 5 mg/m^3 above BG (BG to 0.25 mg/m^3 above BG if radionuclides are present)	Hourly or more frequent, as determined by SSC	Use Level D PPE
			5 to 10 mg/m^3 above BG (> 0.25 mg/m^3 above BG if radionuclides are present)	Continuous	Use Level C PPE and implement dust suppression activities
			>10 mg/m^3 above BG	Not applicable	Stop work and implement dust suppression activities; notify OHSO
Noise	All environmental investigation activities	Sound level meter or rule of thumb test[b]	>85 dBA	When necessary	Use hearing protection

TABLE 3 (Continued)

SITE-SPECIFIC AIR MONITORING REQUIREMENTS AND ACTION LEVELS
TITANIUM METALS CORPORATION FACILITY, HENDERSON, NEVADA

Notes:

APR	Air-purifying respirator
BG	Background
CGI	Combustible gas indicator
dBA	Decibel as measured on the A-weighted scale
FID	Flame ionization detector
LEL	Lower explosive limit
mg/m^3	Milligram per cubic meter
OSHO	On-site Health and Safety Officer
PEL	Permissible exposure limit
PID	Photoionization detector
PPE	Personal protective equipment
ppm	Part per million
VOC	Volatile organic compound

[a] Refer to Table 2 for specific types of gloves, chemical resistant clothing, respirators, and cartridges.
[b] Rule of thumb is inability to hear and understand conversation in normal speaking level when three feet away from person who is speaking.

Appendix A
Forms

HEALTH AND SAFETY PLAN COMPLIANCE AGREEMENT

Project Name: _____

Project Number: _____

I have read and understand the health and safety plan indicated above and agree to comply with all of its provisions. I understand that I could be prohibited from working on the project for violating any of the safety requirements specified in the plan.

Name	Signature	Employer	Date

DAILY TAILGATE SAFETY MEETING FORM

Date: _____ Time: _____ Project No.: _____

Client: _____ Site Location: _____

Site Activities Planned for Today: _____

_____

Safety Topics Discussed
Protective clothing and equipment:
Chemical hazards:
Physical hazards:
Environmental and biohazards:
Equipment hazards:
Decontamination procedures:
Other:
Review of emergency procedures:
Employee Questions or Comments:

DAILY TAILGATE SAFETY MEETING FORM (Continued)

Attendees	
Printed Name	**Signature**

Meeting Conducted by:

_____ _____

Name Title

_____

Signature

DAILY SITE LOG

Site Name: _____ Date: _____

Name (print)	Company	Time	
		In	Out

Comments:

_____

_____

_____

Appendix B
MSDS Sheets

TABLE 1

POTENTIAL CHEMICAL HAZARDS
TITANIUM METALS CORPORATION FACILITY
HENDERSON, NEVADA

Chemical and Media	Exposure Limits/IDLH Level	Exposure Routes	Toxic Characteristics
Poly Chlorinated Biphenyl's (PCB's)	PEL = 0.5 mg/m^3 REL = 0.001 mg/m^3 IDLH = 5 mg/m^3	Inhalation, Skin Absorption, Ingestion, Eye Contact	Irritation eyes, chloracne; liver damage; reproductive effects; [potential occupational carcinogen]
Silver	PEL = 0.01 mg/m^3 REL = 0.01 mg/m^3 IDLH = 10 mg/m^3	Inhalation, Ingestion, Skin and/or Eye Contact	Blue-gray eyes, nasal septum, throat, skin; irritation, ulceration skin; gastrointestinal disturbance
Arsenic	PEL = 0.01 mg/m^3 REL = 0.002 mg/m^3 IDLH = 5 mg/m^3	Inhalation, Ingestion, Skin and/or Eye Contact, Skin Absorption	Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, resp irritation, hyperpigmentation of skin, [potential occupational carcinogen]
Barium	PEL = 15mg/m^3 REL = 10 mg/m^3 IDLH = N.D.	Inhalation, Skin and/or Eye Contact	Irritation eyes, nose, upper respiratory system; benign pneumoconiosis (baritosis)
Chromium	PEL = 1 mg/m^3 REL = 0.5 mg/m^3 IDLH = 250 mg/m^3	Inhalation, Ingestion, Skin and/or Eye Contact	Irritation eyes, skin; lung fibrosis (histologic)
Cadmium	PEL = 0.005 mg/m^3 REL = N.D. IDLH = 9 mg/m^3	Inhalation, Ingestion	Pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, substernal (occurring beneath the sternum) pain; headache; chills, muscle aches; nausea, vomiting, diarrhea; anosmia (loss of the sense of smell), emphysema, proteinuria, mild anemia; [potential occupational carcinogen]

Chemical and Media	Exposure Limits/IDLH Level	Exposure Routes	Toxic Characteristics
Mercury	PEL = 0.1 mg/m^3 REL = 0.05 mg/m^3 (vapor) = 0.05 mg/m^3 (skin) IDLH = 10 mg/m^3	Inhalation, Ingestion, Skin and/or Eye contact	Irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria
Lead	PEL = 0.05 mg/m^3 REL = 0.05 mg/m^3 IDLH = 100 mg/m^3	Inhalation, Ingestion, Skin and/or Eye contact	Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension
Selenium	PEL = 0.2 mg/m^3 REL = 0.2 mg/m^3 (vapor) IDLH = 1 mg/m^3	Inhalation, Ingestion, Skin and/or Eye contact	Irritation eyes, skin, nose, throat; visual disturbance; headache; chills, fever; dyspnea (breathing difficulty), bronchitis; metallic taste, garlic breath, gastrointestinal disturbance; dermatitis; eye, skin burns; in animals: anemia; liver necrosis, cirrhosis; kidney, spleen damage

Notes:
IDLH Immediately dangerous to life or health
mg/m^3 Milligram per cubic meter
NIOSH National Institute for Occupational Safety and Health
OSHA Occupational Safety and Health Administration
PEL Permissible exposure limit
REL Recommended exposure limit

Sources: NIOSH 2005

TABLE 2

TASK HAZARD ANALYSIS
TITANIUM METALS CORPORATION FACILITY
HENDERSON, NEVADA

Task	Potential Hazard	Controls	Initial Level of Protection	Upgraded Level of Protection
General Site Hazards	Driving on the site	Obey all traffic rules.	Level D	Not required
	Working with or near heavy equipment	Be aware of heavy equipment activity and follow SWP 6-26 "Use of Heavy Equipment."		
	Eye injury and overhead hazards	Wear safety glasses and hard hats.		
	Noise	Wear Hearing protection.		
	Slips, trips, falls	Wear proper footwear, watch for uneven terrain, and follow guidelines in SWP 6-9 "Fall Protection Practices" and SWP 6-10 "Portable Ladder Safety."		
	Poisonous plants, insects or snakes	Follow guidelines in SWP 6-17 "Biohazards."		
	Heat stress	Follow guidelines in SWP 6-15 "Heat Stress."		
	Cold stress	Follow guidelines in SWP 6-16 "Cold Stress."		

Task	Potential Hazard	Controls	Initial Level of Protection	Upgraded Level of Protection
Sample soil and sediment, IDW management	General site hazards Inhalation/ingestion of particulates Drowining Chemical hazards	Refer to general site hazards. Remain upgradient of intrusive activity, initiate dust suppression, and/or monitor air in breathing zone; upgrade to Level C. Wear personnel floatation device (PFD) when working around water	Level D • Nitrile gloves • Eye protection • Tyvek coveralls (as determined by OSHO) • Boot covers (as determined by OSHO) • Personnel Floatation Device (as determined by OSHO)	Level C • Chemical hazard exists • Full- or half-face APR with GMC organic vapor/acid/P100 cartridges • Nitrile gloves • Tyvek coveralls (as determined by OSHO) • Boot covers (as determined by OSHO)

Notes:

For the purpose of respiratory protection from respirable dust, a dist mask may be worn. Where excessive dust is present, personnel should consider the use of half- or full-face APR with P100 filter (formerly known as a HEPA air filter) and protective goggles.

APR Air-purifying respirator
HEPA High-efficiency particulate air
PEL Permissible exposure limit (see Table 1)
SWP Safe work practice (see Section 9.5)